The impact of Nursing Intervention Protocol to reduce anxiety and improve quality of life at patients undergoing general surgery

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Abstract

Purpose. Anxiety is a typical phenomenon in patients who are about to undergo any form of surgery and it affects their quality of life (QoL) as concerns their therapeutic rehabilitation and psychological and social reintegration. Verbal information and emotional support could help reduce preoperative anxiety, and contribute to a better quality of life after surgery. The aim of this study was to evaluate the effect of an intervention providing verbal information and a written brochure to be read by the patients as a means of preoperative emotional support prior to inguinal hernia repair and cholecystectomy.

Methods. Patients with planned first operation were randomized into an intervention group (n=200) and a controlled group (n=250). The patients of the control group were routinely informed by their doctor. The patients of the intervention group were offered all necessary information and emotional support in a dialogue one day before surgery in addition to standard care. Verbal information was provided by a trained nurse and patients were also given a written brochure containing all the details of their surgery as well as post surgery instructions.

Results. This study showed that patients who received information from healthcare professionals regarding their surgery had less anxiety before surgery and a better postoperative QoL three months later ($p<0.05$).

Conclusion. Our intervention in patients undergoing general surgery procedures had a beneficial effect on reducing pre- and postoperative anxiety and enabling a better QoL three months later.

Introduction

Stress is one of the factors affecting the psychological status of the patients and is associated with the quality of life (QoL) and postoperative rehabilitation. According to researchers, symptoms of anxiety have been linked to coronary heart disease, sudden cardiac death, and generally to the development of atherosclerosis through various mechanisms in both men and women[1]. Stress causes high blood pressure, irregular breathing, dizziness, and increased heart rate, all of which are unfavorable for the body [2]. Through these stress-induced bodily reactions, the risk of acute or chronic illness undoubtedly increases. An impending surgery causes changes in the physical and emotional state of the patients. In addition to organic symptoms, patients also experience severe negative emotions affecting their QoL [3].QoL should be assessed and reported at all stages of the disease, from the initial diagnosis to the processes of therapeutic rehabilitation and psychological and social reintegration. It should be referred to at all stages, and supportive and psychological support should be provided where necessary [4]. According to a German survey, 62% of cardiac surgery patients would appreciate preoperative interventional psychosocial support by a psychologist or a chaplain [5]. Another similar study found that 44% of almost 300 patients would need psychosocial support on the day of admission for cardiothoracic surgery [6]. The concerns most frequently voiced included nonspecific fear or uncertainty, fear of medical intervention, medical objects or the intensive care unit (ICU), fear of immobility or restriction

and fear of complications or failure of the surgery itself [7]. In accordance with these results, we developed a psychosocial intervention with information and emotional support aimed to reduce preoperative anxiety in patients undergoing general surgery. The purpose of this study was to address the specific concerns and needs of the patient by providing information and emotional support. We evaluated this intervention in a randomized controlled clinical trial [8].

Methods

Data collection

The study sample included 450 patients that were scheduled to undergo general surgery at Attikon General University Hospital of Athens. The investigation conforms to the principles outlined in the Declaration of Helsinki. The study was approved by the Ethics Review Committee of Attikon General University Hospital. All patients gave their informed consent prior to participation.

The study aimed to test the following hypotheses:

1. Assess the severity and incidence of occasional and permanent anxiety in patients undergoing surgery as well as QoL in relation to certain demographic characteristics.

2. Investigate the intensity of permanent anxiety before and after surgery and their quality of life.

3. Investigate whether providing information and emotional support to patients who are about to undergo surgery reduces permanent anxiety intensity and improves their quality of life before and three months after surgery.

This study was designed as an open interventional randomized controlled trial with 1:1 parallel assignment to the intervention and control arms. No important changes were made to the methods after the trial began.

Patient criteria

Patients scheduled for elective first general surgery were enrolled. Male and female patients were eligible. Inclusion criteria included: (1) age ≥18 years, (2) ability to communicate (knowledge of the Greek language, comprehension of the study) and (3) ability to give written informed consent. Exclusion criteria included severe physical and/or mental illness.

Intervention

In a preliminary study, 10 adult inpatients scheduled for cholecystectomy were interviewed after admission. Semi-structured interviews focused on issues related to fear and anxiety and depression regarding the operation and the patient's coping strategies. Responses were analyzed and used to develop the intervention which was tested in this study.

Recruitment and process

Patients were recruited from 15/01/2015 to 30/01/2018 until the predefined number of patients was reached. Patients were handed written information on the study at admission registration. Usual preoperative care includes medical history taking and physical examination on admission by physicians and nurses, provision of information on surgery and anesthesia by surgeons and anesthetists, the obtaining of informed consent, and nursing preparations for surgery. Preoperative information on the course of action regarding surgery, postoperative transfer to the nursing ward and the hospital stay in general is provided by the nurse as part of the admission process. During the trial, study patients were approached by the study nurse and verbally informed of the study. This generally took place the evening before surgery. After obtaining informed consent, patients were randomized to the intervention or control group. The patients were asked to complete the STAI[10,11] and SF36 questionnaires concerning their anxiety and QoL. In addition, sociodemographic and clinical data were obtained from patients and their charts where needed[12]. Thereafter, the intervention was implemented. This involved a dialogue with additional information regarding surgery and postoperative care, as well as emotional support. The intervention was centered on the specific fears reported by the patient. The process generally required 60 min and was conducted by a trained nurse. It was performed according to a chart that was specifically developed for this study (Table 1). Communication with the control group patients was restricted.

Questionnaires

State-Trait Anxiety Inventory for adults of Ch. Spielberger is a crucial tool for measuring anxiety in adults. It has the ability to distinguish between state anxiety and trait anxiety and more general anxiety (trait anxiety) [10.11]. The reliability of the scale for measuring the MA (trait anxiety scale) is high, ranging from 0.65 to 0.86, and for the PA (state anxiety scale) the reliability is 0.16 to 0.62. This low stability is to be expected as it reflects the effect of various emotional states that the patient experiences when completing the scale. The STAI scale has forty questions with four possible answers for each. Feelings of fear, anxiety, tension, nervousness, and sadness are mainly evaluated. The scale scores increase in response to physical risk and psychological stress and decrease after relief or relaxation. It estimates the emotions experienced by respondents at a certain point in the recent past, predicting how they will respond to a situation they are likely to face in the future, or to a variety of hypothetical situations. The nature of the variables in both cases expresses both positive and negative emotions. On a four-point Likert scale, respondents are able to note for each variable the degree of agreement: none, somewhat, moderate and too much for occasional anxiety; and almost never, sometimes, often, almost always, for permanent stress. The SF-36[12] Health Overview was created in Boston in 1992 by Ware and Shelbourne to achieve the psychometric specifications required to compare the level of health among different population groups, different categories of healthy and ill, or among different treatment modalities. The 36 questions consist of 8 scales of 2 to 10 questions each: a) Physical Function, b) Physical Role, c) Physical Pain, d) General Health, e) Vitality, f) Social Functionality, g) Emotional Role and h) Mental Health[13]. These 8 sub-scales form summary measurements on two general scales: the Physical and Mental Health scales. The SF-36 Health Overview is suitable for self-report and face-to-face interviewing. In addition to the dependent variables,

the questionnaire also included demographics such as gender, age, marital status, educational level, co-morbidity[14].

Statistical analyses

Sample size was calculated based on previously published interventional studies using the Spielberger State-Trait Anxiety and SF36. The Cronbach's index was used for the reliability of the questionnaires. Correlation between the quantitative variables was measured using Pearson's correlation. A paired t-test was used to compare mean values between two measurements, and t-test and ANOVA were applied to determine mean values based on demographic/clinical characteristics, as well as Wilcoxon and Kruskal Wallis non-parametric tests. Kolmogorov-Smirnov and Shapiro Wilk tests were used to assess normality and the Levene's test was performed to evaluate homogeneity. Multiple controls for pairwise comparisons were the Games-Howell controls (heterojunction). Analysis was done in IBM SPSS 20. The level of statistical significance is αlpha = 0.05. Internal consistency reliability (Cronbach's index) is greater than 0.70 for all dimensions of both questionnaires, signifying that patient responses were valid and the results of our research were reliable and unbiased. The results are shown in Table 2.

Results

Our sample included 450 patients who underwent surgery. The mean age of the patients was 59.23 years (± 12.42 years), most of whom were male (n = 287, 63.8%), had a bile problem (n = 250, 55.6%), were married (n = 391, 86.9%), and lived in Attica (n = 260, 57.8%). Most of the patients did not receive any type of training before surgery (n = 250, 55.6%), while the remainder received training (n = 200, 44.4%). The results are shown in detail in Table 3.

First dimension measurements are as follows: the mean of Physical Function is 67.04 (± 31.52), Physical Role 58.11 (± 42.29), Emotional Role 70.30 (± 38.26), Vitality 59.59 (± 23.96), Mental Health dimension 62.25 (± 24.09), Social Functionality 62.56 (± 27.08), Physical Pain is 52.74 (± 28.93), and General Health 65.11 (± 20.49). Temporary Stress has an average value of 2.43 (± 0.55), while Permanent Stress has an average value of 2.00 (± 0.52). Second dimension measurements: the mean of Physical Function is 94.31 (± 19.90), Physical Role 97.58 (± 20.13), Emotional Role 95.78 (± 20.13), Vitality 78.79 (± 16.39), Mental Health 83.52 (± 15.14), Social Functionality 92.42 (± 20.26), Physical Pain 93.42 (± 17.92), and General Health 75.43 (± 20.22). Temporary Stress has an average value of 1.68 (± 0.54), while Permanent Stress has an average value of 1.92 (± 0.54). The above results are shown in detail in Table 4. Pearson's correlation coefficient r was used to measure the degree of correlation among dimensions. The coefficients r for each combination of variables are shown in tables 5, 6 and 7. Note that since the table with the correlation coefficients is symmetric above and below the diagonal, the lower diagonal shows correlations among the variables for the 1st measurement, the upper diagonal shows correlations among the variables for the 2nd measurement and finally, the main diagonal shows correlations of the 1st and 2nd measurement variables.

The correlations between the 1st and 2nd measurement for each dimension were statistically significant and included the following: Physical Functioning ($r = 0.52$, $DF = 448$, $p < 0.01$), Emotional Role ($r = -0.16$, $DF = 448$, $p < 0.01$), Vitality ($r = 0.68$, $DF = 448$, $p < 0.01$), Mental

Health (r = 0.53, df = 448, p <0.01), Social Functionality (r = 0.29, DF = 448, p <0.01), as well as General Health (r = 0.84, DF = 448, p <0.01), and finally, Temporary Anxiety (r = 0.58, DF = 448, p <0.01) and Permanent Anxiety (r = 0.96, DF = 447, p <0.01).Results from the paired t-test showed that there is a difference between the two measurements (before and after surgery) for all scales of the questionnaire (paired t-test, p <0.001 for all) Table 8. It was observed that trainees had statistically significantly lower values than non-learners concerning Physical Role (t = 4.57, DF = 199, p <0.001) and Emotional Role (t = 4.57, DF = 199, p <0.001) variables, whereas they had statistically significantly higher values for variables related to Vitality (t = -2.98, DF = 367, p = 0.003), Mental Health (t = -2.90, DF = 89, p = 0.004), and Permanent Anxiety (t = 3.62, DF = 360, p <0.001).

Discussion

This randomized controlled study examined the effectiveness of a short-term intervention using information and emotional support for patients one day prior to surgery. The primary goal was the reduction of preoperative anxiety as well as the better QoL three months after surgery. The group of patients who received the intervention reported a reduced state of anxiety after the intervention and before surgery compared to the group of patients who only received routine medical and organizational information. Furthermore, patients in the intervention group demonstrated a more pronounced reduction in state anxiety three months after surgery compared to the control group. Previous publications identified the subjective need for psychosocial support [5.6] but they did not examine the influence on clinical outcome. However, a number of other publications showed an association between levels of anxiety and postoperative course. [15.16]. A recent systematic review found that psychological treatment is slightly better than standard care in reducing postoperative mental distress; however, the evidence is of low quality [17]. There are very few examples of randomized trials that have actually evaluated preoperative anxiety following a cognitive intervention, e.g. by Lin and Wang [18] or Van Zuuren et al. [19] Other attempts to reduce anxiety have included an exercise program without psychological intervention [20], music interventions [21], guided imagery [22], hypnosis [23] and meditation [24]. Our study differs from previous investigations with regard to the short time frame. This is due to short preoperative periods, which are common in our country, with short waiting lists and most often admission on the day before surgery, as a result of which patients have to adapt to the thought of an upcoming surgery quite quickly. Therefore, supportive interventions must fit into this tight schedule in order to be effective. We implemented a short-term intervention to be administered on the evening before surgery. The reduction of state anxiety was significantly better in the intervention group. Our intervention was designed as an individualized approach focusing on the patient's needs and experiences. The importance of such patient-specific practice has been previously emphasized [25]. The information content of the intervention was adapted with consideration to the patients' responses to the questionnaire and the issues they raised during the intervention. Denial was accepted, and most of the patients in the intervention group considered the dialogue as helpful or very helpful. According to Natale P. et al.[26], cognitive behavioral therapy, exercise or relaxation techniques can reduce depressive symptoms (moderate-certainty evidence) in adults with ESKD treated with dialysis. Cognitive behavioral therapy increases health-related quality of

life. Evidence regarding spiritual practices, acupressure, telephone support, and meditation is of low certainty. Similarly, evidence of the effects of psychosocial interventions on suicide risk, major depression, hospitalization, withdrawal from dialysis, and adverse events is of low or very low certainty. Zou H et al.[27] showed that mindfulness-based interventions are beneficial for patients with heart failure in reducing depression and anxiety and enhancing health-related quality of life in the short term. These findings should be carefully generalized considering the methodological limitations across studies. More rigorous studies are required to examine further the effects of mindfulness-based interventions in patients with heart failure. According to the results of Abazarnejad et al.[28], psycho-educational counseling can significantly reduce anxiety levels in pregnant women with pre-eclampsia. Consequently, it is recommended that healthcare providers offer pregnant women therapeutic intervention after hospitalization, in order to reduce their anxiety level and its subsequent negative outcomes. A study by Lemos MF et al.[29] showed that pre-surgery anxiety levels of cancer patients can be significantly reduced by educating patients on the planned surgical and anesthetic procedures in a preoperative anesthetic setting. Preoperative anxiety has been classically associated with the patient's concerns about disease, hospitalization, anesthesia and surgery. Moreover, fear of the unknown is one of the most important sources of anxiety among surgical outpatients attending a pre-anesthetic consultation, especially before invasive surgery. Ortiz et al. [30] reported that preoperative education using leaflets improved patient satisfaction as regards their knowledge of the perioperative process but did not reduce anxiety related to surgery. On the contrary, the use of informational one-page leaflets has already been suggested to significantly reduce anxiety before surgery[31]. Moreover, preoperative anxiety is shown to be reduced when additional anesthesia information in print and video format is made available prior to surgery[32].

Limitations

The study has methodological limitations. The patients who refused to participate in the study could have been in particular need of emotional support. The most frequent reason given for refusal was that when approached for participation, they already felt weary after the demands of the day due to admission procedures, clinical examinations and medical information provided by several persons.

Conclusions

Our study aimed to evaluate a preoperative anxiety-reducing intervention for patients shortly before undergoing general surgery. The data indicate that an individualized, psychosocial intervention is more effective in reducing preoperative anxiety surgery than routine information. The results support training for nurses and physicians to provide emotional support to patients before surgery. We assume that our approach can also be applied to other types of surgery. Further research should address the differentiation between cognitive and emotional aspects of pre-surgery anxiety and also consider patient coping strategies, including the demand for more information, or the factor of psychological denial.

Table I: Elements of the treatment manual for the psychosocial intervention before general surgery using information and emotional support

Theoretical background
Aims of the information
General ward of surgery department
Psychosocial intervention
Open dialogue
Information regarding the ward stay according to the patient's need for information
Information regarding postoperative pain management
Focusing on the patient's specific fears based on the completed questionnaire

Table II: Cronbach α Index for all dimension of both questionnaires .

Dimensions	# items	1st Measurement	2nd Measurement
SF36			
Physical Function	10	0.96	0.97
Physical Role	4	0.88	0.98
Emotional Role	3	0.79	0.98
Vitality	4	0.86	0.89
Mental Health	5	0.87	0.90
Social Functionality	2	0.77	0.72
Physical Pain	2	0.92	0.97
General Health	5	0.77	0.85
Spielberger STAI			
Temporary Stress	20	0.81	0.93
Permanent Stress	20	0.90	0.92

Table III : Frequencies for the quality characteristics of the sample.

	Frequencies (N)	**Related Frequencies. (%)**
Sex		
Male	287	63.8%
Female	163	36.2%
Intervention		

No	250	55.6%
Yes	200	44.4%
Disease		
Hernia	200	44.4%
Cholelithiasis	250	55.6%
Marital status		
Married	391	86.9%
Unmarried	38	8.4%
Widower	21	4.7%
Education		
Primary School	156	34.6%
High School	188	41.8%
University/ Master/Phd	106	23.6%
Occupation		
Unemployed	29	6.5%
Public Servant.	46	10.2%
Private Employee.	176	39.1%
Freelancer.	136	30.2%
Domestic	63	14.0%
Accomodation		
Attika	260	57.8%
Other	190	42.2%
Number of Children		
0	36	8.0%
1	71	15.8%
2	243	54.0%
3+	100	22.2%
Age of Children		
0-2	13	2.9%
3-6	23	5.1%
7-12	7	1.6%
12-18	36	8.0%
19+	325	72.2%
Special Care		
Yes	338	75.1%
No	112	24.9%
Other Disease		
Yes	65	14.4%
No	385	85.6%
Living with		
Parents	16	3.6%
Wife/Husband	336	74.7%
Children	16	3.6%
Alone	36	8.0%
Family	46	10.2%

Table IV *:* Basic descriptive measures for all dimensions of the 2 questionnaires based on measurement.

	Measurement	Sample	Min	Max	Mean	SD	Median
SF-36							
Physical	1	450	0	100	67.04	31.52	80
Functionality	2	450	0	100	94.31	19.90	100
Physical	1	450	0	100	58.11	42.29	50

Role	2	450	0	100	95.78	20.13	100
Emotional Role	1	450	0	100	70.30	38.26	100
	2	450	0	100	95.78	20.13	100
Vitality	1	450	0	100	59.59	23.96	60
	2	450	0	100	78.79	16.39	80
Mental Health	1	450	4	100	62.25	24.09	60
	2	450	16	100	83.52	15.14	84
Social Functionality	1	450	0	100	62.56	27.08	62.5
	2	450	0	100	92.42	20.26	100
Physical Pain	1	450	10	100	52.74	28.93	55
	2	450	10	100	93.42	17.92	100
General Health	1	450	5	95	65.11	20.49	65
	2	450	0	100	75.43	20.22	80
***Spielberger* STAI**							
Temporary Stress	1	450	1.3	3.65	2.43	0.55	2.40
	2	450	1.3	3.65	1.68	0.54	1.45
Permanent Stress	1	449	1.1	3.05	2.00	0.52	1.95
	2	449	1.0	3.05	1.92	0.54	1.80

Table V: Pearson correlation coefficients for the dimensions of the SF-36 questionnaire.

	Age	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
Age	***1***	0.09	0.03	0.03	-0.02	-0.18	0.11	0.15	-0.23
X_1	-0.14	***0.52***	-0.06	-0.06	0.75	0.64	0.62	0.59	0.76
X_2	0.14	0.14	***0.04***	1.00	-0.02	0.05	0.44	0.45	-0.05
X_3	-0.13	0.20	0.70	***-0.16***	-0.02	0.05	0.44	0.45	-0.05
X_4	-0.10	0.57	0.26	0.39	***0.68***	0.89	0.60	0.65	0.74
X_5	-0.12	0.55	0.26	0.46	0.85	***0.53***	0.56	0.60	0.65
X_6	-0.07	0.42	0.42	0.48	0.70	0.73	***0.29***	0.85	0.45
X_7	-0.07	0.32	0.46	0.41	0.60	0.54	0.63	***0.05***	0.42
X_8	-0.22	0.59	0.01	0.19	0.69	0.60	0.51	0.33	***0.84***

X_1: Physical Functionality, *X_2:* Physical Role, *X_3:* Emotional Role, *X_4:* Vitality, *X_5:* Mental health, *X_6:* Social Functionality, *X_7:* Physical Pain, *X_8:* General Health

Table VI : Pearson correlation coefficients for the dimensions of the SF-36 questionnaire and those of the Spielberger STAI Anxiety Scale for both measurements.

	1st Measurement		2nd Measurement	
	Temporary Stress	Permanent Stress	Temporary Stress	Permanent Stress
SF-36				
Physical Function	-0.44	-0.27	-0.68	-0.34
PhysicalRole	0.06	-0.08	-0.03	0.08
Emotional Role	-0.11	-0.22	-0.03	0.08
Vitality	-0.52	-0.59	-0.60	-0.51
Mental Health	-0.54	-0.68	-0.47	-0.40
Social Functionality	-0.40	-0.49	-0.63	-0.24
Physical Pain	0.01	-0.18	-0.49	-0.15
General Health	-0.57	-0.53	-0.60	-0.46

Table VII: Pearson correlation coefficients for the two dimensions of STAI questionnaire anxiety.

	Age	TS	PS
Age	1.00	-0.06	0.02
TS	0.27	0.58	0.51

PS	0.03	0.54	0.96

*TS: Temporary Stress, **PS: Permanent Stress

Table VIII : Results of paired t test for the dimensions of both questionnaires.

	t	df	p value
SF-36			
Physical Functionality	21.21	449	<0.001
Physical Role	17.33	449	<0.001
Emotional Role	11.73	449	<0.001
Vitality	23.08	449	<0.001
Mental Health	21.98	449	<0.001
Social Functionality	22.03	449	<0.001
Physical Pain	25.95	449	<0.001
General Health	18.85	449	<0.001
Spielberger STAI			
Temporary Stress	-32.26	449	<0.001
Permanent Stress	-10.77	448	<0.001

Fig. 1 : Radar chart before and after surgery.

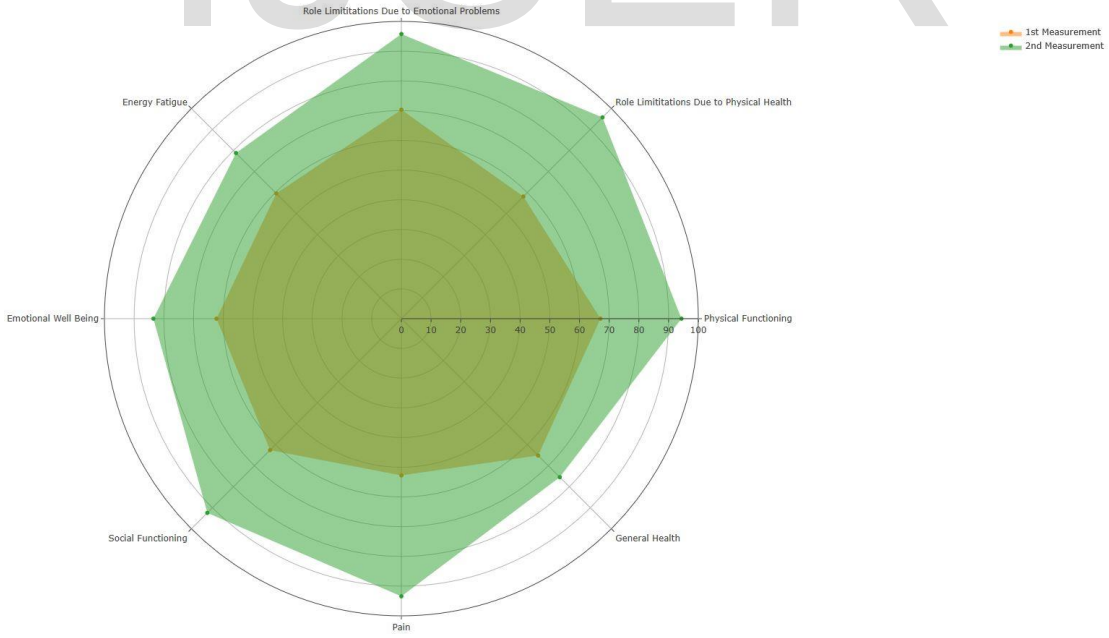
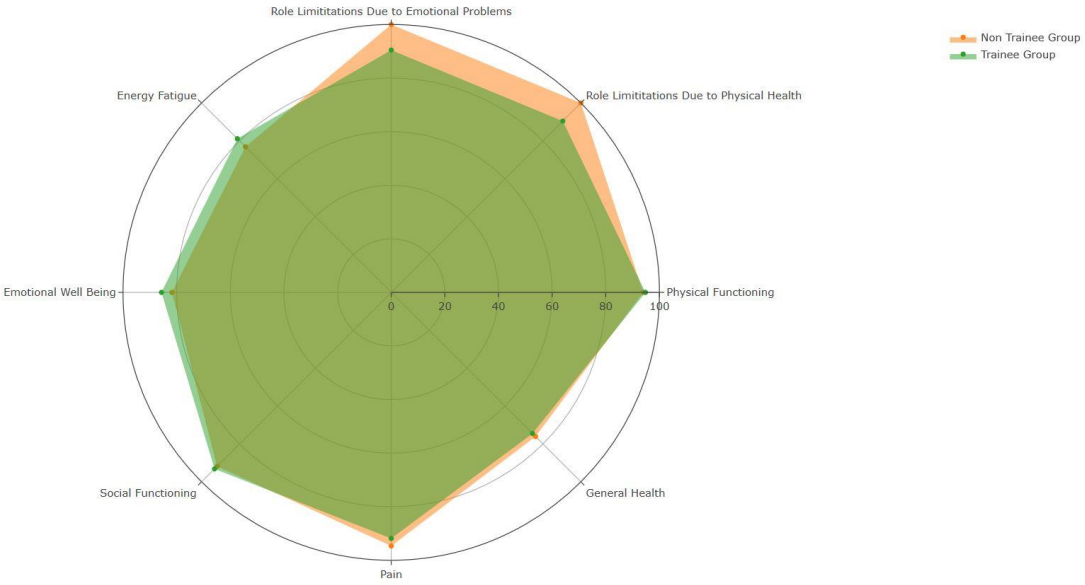


Fig. 2 : Radar chart for treatment group



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Ethics declarations

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all participants included in the study.

Key words: general surgery, preoperative anxiety, psychosocial intervention, quality of life(SF 36).